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ingly greater part of our time left for acquiring and employing really useful knowledge, and the purposes and results of scientific investigation would be understood and appreciated by a larger part of the public than is now the case.

WILLARD G. VAN NAME

NEW YORK STATE MUSEUM

AMERICAN SANITATION

TO THE EDITOR OF SCIENCE: The writer has just finished reading Dr. Ford's most interesting article on "American Sanitation," in your issue of July 2, and wishes to endorse heartily the plea therein contained for more extensive and better training in public health. The writer feels, however, that he must differ with Dr. Ford as to the wisdom of excluding all but physicians from participation in health work. Dr. Ford evidently assumes that there is no essential difference between community hygiene and personal hygiene, and that a thorough medical training, with its time-consuming studies of anatomy, histology, obstetrics, materia medica, etc., is essential before undertaking special work along the lines of sanitation, or the protection of the community from disease.

The present writer holds no brief for the ordinary engineer in positions of high responsibility in general health work, but he can not help feeling that a well-trained sanitary engineer would distinguish his incumbency of the health officership of a town, about as well as an eye and ear specialist would do. In fact, the chances are that neither would be conspicuously successful.

The ideal health officer should be neither an M.D. nor a C.E. but should be an expert in community hygiene, such expertness combining a knowledge of both branches (and some others). It should be possible for a young man desirous of entering the field of public health to secure training for that service without being compelled to undertake the study of a great many medical subjects which have to do with curative rather than with preventive medicine; and also without having to learn about highways, railways and framed struc-

tures. He should, upon completion of such a course of training, be thoroughly conversant with the causation and transmission of disease; and have enough engineering training to enable him to look upon problems in municipal sanitation with that sense of perspective which is found more highly developed among civil engineers than among physicians.

An amusing story illustrating that lack of quantitative appreciation, or perspective is vouched for by one of the writer's professional friends. A practising physician in one of our large cities sent a communication to the health commissioner in which he recommended the addition of some mild laxative to the city water to counteract the baleful effects of the coagulants applied previous to filtration. Of course, it is to be understood that this is recognized as an extreme case, but in the course of ten years' experience as a sanitary engineer, the writer has heard many decidedly puerile things said by physicians who pretended to some knowledge of sanitation.

WM. T. CARPENTER

BROOKLYN SEWAGE DISPOSAL
EXPERIMENTAL STATION

ANIMAL MALFORMATIONS

TO THE EDITOR OF SCIENCE: Referring to the communication on "a chicken with four legs" in SCIENCE, page 90, I would say, lest the malformation should be considered rare, that we have in this museum quite a number, fourteen from the chicken alone, showing various degrees of the malformation; also from the duck and turkey, and from some higher animals as the dog, pig and kitten. Technically the malformation is known as *dipygus* or preferably as *dipygus parasiticus*.

D. S. LAMB

U. S. ARMY MEDICAL MUSEUM,
WASHINGTON, D. C.

THE LONG COST OF WAR

TO THE EDITOR OF SCIENCE: The writer is interested in gathering material bearing on the eugenics of war and militarism. It is obvious that these influences tend to weaken a nation through the destruction of those physically the best and through the debarring of

the soldier from honorable parenthood. In addition to abundant records from Europe and America, we have the following facts from Japan.

The war between China and Japan occurred twenty years ago. It involved the destruction of a large number of picked men of Japan and a corresponding reduction in the virility of the nation. The effects of the loss on the succeeding generation can not be felt until the children born in 1895 attain their majority. These results can be measured only in the reduced stature of the incoming conscripts and in the proportion of exemptions from military service. "Like the seed is the harvest." The new generation takes the quality of those men and women who were its actual parents. Those whom war has destroyed, in general the stronger and the best developed physically, are not represented.

According to the *Asahi* of Tokyo, as translated in the *Japan Chronicle*, the number of available conscripts in Tokyo for this year is 9,235, instead of 9,981. For a number of years there had been a steady increase of about 800. This falling off of 1,546 marks a decrease of over 16 per cent. In Kanda, the most densely populated ward of Tokyo, the decrease was 22 per cent.

In the whole nation, a slight increase of conscripts has taken place, 482,965 as against 472,147 of 1914. But this rate of increase (9,000) is only from thirty to fifty per cent. of the normal, which for years has ranged from 20,000 to 30,000.

More important than the reduction in numbers is the lowering in quality. In Kanda in 1914, twenty-four per cent. of the conscripts were passed as "strong," while in 1915, the percentage was thirteen per cent. (83 out of 635, instead of 194 out of 813). A much larger percentage of those sent to the barracks were of the "average" class.

The birth-rate in Japan, as in every other nation, declined in time of war, to rise again at its conclusion.

This decline of physique is a matter of concern to the military authorities of Japan, but they optimistically hope that it is of a tempo-

rary nature. The *Asahi* concludes that "most of those who underwent conscript examinations this year were born during the war and therefore are sons of those too old or too weak to go to the front, and so it is no surprising thing if the conscripts of 1915 are of exceptionally delicate constitution."

DAVID STARR JORDAN

July 24, 1915

SCIENTIFIC BOOKS

Key to the Families of North American Insects. By CHARLES T. BRUES AND A. L. MELANDER. Boston, Mass., and Pullman, Wash., published by the authors, 1915.

Most modern works on entomology contain keys or tabular synopses, intended to facilitate the determination of families, genera and species. It is the experience of those who have classes in entomology that these keys are on the whole unsatisfactory, being frequently incomplete, incorrect or unintelligible. The most noteworthy exception is found in Williston's "Manual of North American Diptera" (1908), which, considering its scope, could hardly be improved. One who has constantly used Williston's book for a number of years becomes convinced that it is possible to prepare keys which will in nearly every case enable the student to determine the genus of the insect before him, especially when he has also the aid of numerous outline figures. It is really astonishing how soon a clever student will learn to use works of this kind; at Boulder we find that students using an illustrated table of Rocky Mountain bees can frequently determine correctly as many as four genera in an hour, in spite of the fact that the insects and the kind of work are new to them. Exceptional students do even better than this.

The method having proved so satisfactory, Professors Brues and Melander thought it worth while to prepare a key to all the families of North American insects, illustrated, like Williston's book, with many outline figures. Thus we have for the first time a complete synopsis of the families, whereby the student may find the place in the taxonomic system of